

REMARKS

Status of the Application

Claims 1-44 are all the claims pending in the Application. Claims 1-20 stand rejected. Claims 21-44 are currently withdrawn from consideration in view of the Examiner's election requirement, discussed below.

Election Requirement

The Examiner alleges that claims 21-44 are "directed to inventions that are independent or distinct from the invention originally claimed." Thus, the Examiner has withdrawn claims 21-44 from consideration, alleging that claims 1-20 have been constructively elected by original presentation. Applicants respectfully disagree with this election requirement.

First, the Examiner alleges that independent claim 1 recites a reflection type liquid-crystal display device comprising a visual-side substrate including: (1) a transparent substrate; (2) a transparent layer lower in reflective (refractive) index than the transparent substrate; and (3) a transparent electrode. Applicants agree that original claim 1 was so directed, and point out that these features read on the exemplary embodiment of FIG. 1, which shows a visual side substrate including: (1) a transparent substrate (*e.g.*, element 21 in FIG. 1); (2) a low refractive index transparent layer (*e.g.*, element 22 in FIG. 1); and (3) a transparent electrode (*e.g.*, element 24 in FIG. 1).

Newly added claim 21 is similar to original claim 1, but recites, *inter alia*, "a visual-side substrate comprising a transparent layer, a low-refractive-index transparent layer lower in refractive index than the transparent layer, and a transparent electrode layer." In other words,

inter alia, independent claim 21 recites a “transparent layer,” rather than the “transparent substrate” of independent claim 1, as being a part of the recited “visual side substrate.”

Nevertheless, both the “transparent layer” of claim 21 and “transparent substrate” of claim 1 read on element 21 in FIG. 1. In fact, claim 21 in its entirety reads on FIG. 1, just as claim 1 does.

Newly added claim 40 is similar to pending claim 20, but recites, *inter alia*, “a visual-side substrate, on an upper surface of the liquid crystal layer, comprising a transparent electrode layer, a low-refractive-index transparent layer on the transparent electrode layer, and a transparent layer on the low-refractive-index transparent layer, wherein the low-refractive-index transparent layer is lower in refractive index than the transparent layer.” In other words, *inter alia*, independent claim 40 recites a “transparent layer,” rather than the “transparent substrate” of independent claim 20, as being a part of the recited “visual side substrate.” Nevertheless, both the “transparent layer of claim 40” and “transparent substrate” of claim 20 read on element 21 in FIG. 1. In fact, claim 40 in its entirety reads on FIG. 1, just as claim 20 does.

However, despite the fact that all of the independent claims 1, 20, 21 and 40 read on FIG. 1 of the Application, the Examiner currently alleges that new independent claims 21 and 40 “are drawn to alternate species of the invention limited to visual-side substrates that do not read on the originally claimed visual-side substrate [of claim 1] ... because they do not comprise a visual-side substrate including a transparent substrate.” Thus, it is believed that the Examiner is alleging that new claims 21 and 40 are directed to a different species of the invention simply because they recite a “transparent layer” rather than the “transparent substrate” of claims 1 and 20. Applicants respectfully submit that this is not proper, as: (1) the Examiner has not complied

with the basic requirements of making an election requirement; and (2) the differences in recitations of the respective claims do not signify that there are different species of the invention.

First, as indicated in MPEP § 809.02(a), when requiring an election of species, the Examiner should: (1) “identify generic claims or indicate that no generic claims are present;” (2) “clearly identify each ... of the disclosed species, to which claims are to be restricted[,] ... as the species of figures 1, 2, and 3 or the species of examples I, II, and III, respectively;” (3) “[p]rovide reasons why the species are independent or distinct.” The Examiner has not followed a single one of these courses of action, and has therefore failed to adequately advise Applicants as to what embodiments the Examiner considers to be distinct species.

Second, the Examiner’s allegation that claim recitations themselves somehow provide the basis for identifying different species of the invention is also incorrect. Rather, as explained in MPEP § 806.04(e), “[c]laims are definitions of inventions. Claims are never species. The scope of a claim may be limited to a single disclosed embodiment (i.e., a single species, and thus be designated a specific species claim), or a claim may include two or more of the disclosed embodiments within the breadth and scope of the claim (and thus be designated a generic or genus claim).”

In this instance, the scope of each of the independent claims 1, 20, 21 and 40 encompasses the embodiment shown in FIG. 1 of the Application. Thus, independent claims 1, 20, 21 and 40 are, at the very least, species claims with respect to the embodiment of FIG. 1. As the species shown in FIG. 1 has already been prosecuted (via claim 1), the Examiner cannot now require a restriction to a different species.

Additionally, independent claims 1, 20, 21 and 40 are believed to be generic to all of the configurations shown in FIGS. 1-8 of the invention.

Thus, Applicants respectfully request the withdrawal of this election requirement, and the issuance of a new Office Action considering independent claims 21 and 40 (and dependent claims 22-39).

Provisional Rejections Under Obviousness-Type Double Patenting

The Examiner has provisionally rejected claims 1 and 20 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over: (1) claims 1-8 of co-pending application 09/898,060; (2) claims 1-22 of co-pending application no. 09/878,268; and (3) claims 1-38 of co-pending application 10/225,532.

As these are provisional rejections, Applicant elects to defer addressing their merits. Such deferral is clearly contemplated by MPEP § 804(I)(B), which states that a “provisional” double patenting rejection is designed simply to make Applicant aware of a potential problem.

Applicant reserves the right to address the merits of the provisional double patenting rejection or submit a terminal disclaimer to obviate the rejection.

Provisional Rejections Under Obviousness-Type Double Patenting

The Examiner has rejected claims 1 and 20 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent 6,710,840.

Applicants again respectfully submit that claims 1-9 of U.S. Patent 6,710,840 fail to teach or suggest:

(1) independent claim 1's recitation of "an optical path control layer having a repetitive structure of optical path changing slopes on an outer side of said visual-side substrate and being higher in refractive index than said low-refractive-index transparent layer, each of said optical path changing slopes being inclined at an inclination angle in a range of from 35 to 48 degrees with respect to a reference plane of said visual-side substrate;" and

(2) independent claim 20's recitation of "an optical path control layer on an upper surface of the visual-side substrate, comprising a repetitive structure of optical path changing slopes on an upper surface thereof, wherein each of the optical path changing slopes is inclined at an angle from 35 to 48 degrees with respect to a reference plane of the visual-side substrate."

Specifically, none of the pending claims 1-9 of U.S. Patent 6,710,840 even mention the use of a particular "optical path control layer," let alone that any such layer has a "repetitive structure of optical path changing slopes," or that these slopes are inclined "from 35 to 48 degrees with respect to a reference plane" of the visual-side substrate (or any other equivalent structure).

Although it is not entirely clear from the explanation provided with this rejection, it seems that the Examiner is alleging that the "optical path converting means" recited in dependent claim 9 of U.S. Patent 6,710,840 is somehow equivalent to the "optical path control layer." However, Applicants respectfully submit that there is no mention in claim 9 of U.S. Patent 6,710,840 (or any other claim therein) that the "optical path converting means" provides any structure even remotely equivalent to that recited in independent claims 1 and 20 and pointed out above.

Thus, Applicants respectfully submit that claim 1 of the instant Application cannot reasonably be read as being obvious in view of claims 1-9 of U.S. Patent 6,710,840, and respectfully request the withdrawal of this rejection.

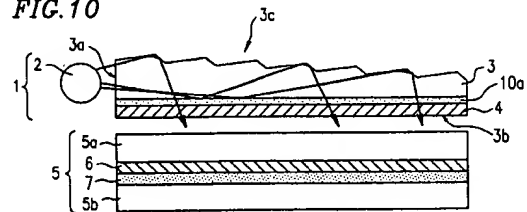
Claim Rejections

The Examiner has rejected, under 35 U.S.C. § 103(a): (1) claims 1-8 and 12-14 and 20 as being unpatentable over *Masuda et al.* (US 6,340,999; hereinafter “*Masuda*”) in view of *Egawa et al.* (US 6,295,104 B1; hereinafter “*Egawa*”); (2) claims 13 and 14 as being unpatentable over *Masuda* in view of *Egawa* and *Evanicky et al.* (US 6,243,068 B1; hereinafter “*Evanicky*”); (3) claims 9-11 and 15-17 as being unpatentable over *Masuda* in view of *Egawa* and *Yano et al.* (JP 11-326903; hereinafter “*Yano*”); and (4) claims 18 and 19 as being unpatentable over *Masuda* in view of *Egawa* and *Nemoto et al.* (US 6,456,344; hereinafter “*Nemoto*”). These rejections are respectfully traversed.

(A) The Applied References

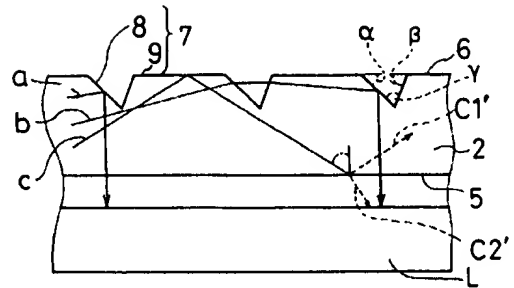
Masuda (see FIG. 10 reproduced to the right) discloses a reflective type liquid crystal display 5, consisting of glass substrate 5a, liquid crystal layer 6, reflector 7, and glass substrate 5b. A separate front

FIG. 10



light 1 consisting of a light guide 3, low refractive resin layer 10a, and a polarization selecting section 4 is arranged above glass substrate 5. Front light 1 is not part of reflective type liquid crystal display 5, but rather is separated therefrom by an air gap.

Egawa discloses (see FIG. 3 reproduced to the right) an illumination apparatus having a liquid crystal light element L, a transparent member 11, a transparent substrate 2 with triangular grooves 8, and a light source 4 (see FIG. 2). *Egawa* indicates that



the transparent member 11 has an equal or lower refractive index than transparent substrate 2, to improve the reflective properties of the apparatus (col. 5, line 40 - col. 6, line 22).

Thus, both *Masuda* and *Egawa* disclose reflective LCD structures where a front light section (1 in *Masuda* and 2 in *Egawa*) is arranged in front of a liquid crystal section (5 in *Masuda* and L in *Egawa*). However, the actual configurations of *Masuda* and *Egawa* are quite different.

Specifically, *Masuda* is directed to a particular type of front light LCD that has a front light 1 that: (1) is separated from the liquid crystal display 5 by an air gap; and (2) reduces in thickness as it extends away from a light source 2. In contrast, *Egawa* is directed to a system that has a front substrate 2 that is: (1) connected to a liquid crystal element L by an transparent member 11; and (2) of a constant thickness as it extends away from a light source 2.

(B) The Examiner's Position

The Examiner alleges that *Masuda* discloses all of the features of independent claim 1, except that it fails to “explicitly teach in the text that [the] angle of slopes illustrated in Figure 10 [is] within the range of 35 to 48 degrees” (O.A., pg. 8, lines 1-2). In an attempt to show that such features were known, the Examiner cites col. 8, lines 28-33 *Egawa*, which discloses that

angles α of consecutive grooves 8 (see FIG. 3) may be varied from 48° to 52° to 46°. Further, the Examiner alleges that *Egawa* “is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add an angle of slope of 38 to 44 degrees to improve .. display performance,” and that it would therefore be obvious to modify *Masuda* in view of *Egawa*.

Applicants respectfully disagree, and submit that: (1) one of ordinary skill in the art at the time of the invention (“one of skill”) would not have been motivated to modify *Masuda* in view of *Egawa* as the Examiner alleges; and (2) even the alleged combination of *Masuda* and *Egawa* fails to teach or suggest many of the features recited in independent claim 1.

(C) There Would Have Been No Motivation to Modify Masuda In View of Egawa

As discussed above, *Masuda* and *Egawa* are directed to front light LCDs of different construction. *Masuda* discloses a front light 1 that decreases in thickness as it extends from light source 2, and which has a series of “periodic concave and convex portions 3f formed at a predetermined pitch in the shape of a prism, [each with] a propagation portion 3d and a reflection portion 3e” (col. 10, line 65 - col. 11, line 8). Further, *Masuda* discloses a specific relationship between the lengths of the propagation portions 3d and the reflections portions 3e, in this case, 370 μm to 20 μm , respectively. This configuration helps direct light generally downward toward the liquid crystal display 5. In contrast, *Egawa* is directed to a front light 2 that is of a constant thickness as it extends from its light source 4. Further, *Egawa* does not provide repeating convex and concave portions, but rather provides repeating grooves 8.

The Examiner alleges that one of skill would have been motivated to modify the periodic concave and convex portions 3f of the reducing thickness light guide 3 of *Masuda* to incorporate the specific angular relationships of the grooves of *Egawa*. Applicants disagree.

Masuda does not utilize grooves that are at all similar to those of *Egawa*. Rather, *Masuda* provides repeating convex and concave portions with a specific length interrelationship to provide internal reflection for its light guide 3. There is no teaching or suggestion (or even any reason to believe) that the modification of the specific length interrelationship disclosed in *Masuda* to incorporate the angular relationship of grooves of *Egawa* would provide anything other than a deleterious result.

Specifically, the Examiner has not cited any reason why one of skill would have made such a modification. There is no teaching or suggestion of any deficiency that would require such a modification in *Masuda*, and *Egawa* is equally silent regarding any such deficiency, as it is directed to a different kind of reflection system (a constant thickness grooved transparent substrate 2).¹

Accordingly, Applicants respectfully submit that one of skill would not have modified the specific construction of *Masuda* to provide the grooves of *Egawa*.

¹ The Examiner must “show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for a combination in the manner claimed.” *In re Rouffet*, 47 USPQ2d 1453 (Fed.Cir. 1998). The mere fact that references can be “combined or modified does not render the resultant combination [or modification] obvious unless the prior art also suggests the desirability of the combination [or modification].” *In re Mills*, 916 F.2d 680 (Fed.Cir. 1990); MPEP §2143.01.

(D) The Examiner's Identification of Multiple Discrete Layers Separated By Gaps As A Single "Substrate" Is Unreasonable

Claims 1 and 20 recite a "visual side substrate" which includes a "transparent substrate" (e.g., element 21 in FIG. 1), a "low refractive index transparent layer" (e.g., element 22 in FIG. 1) and a transparent electrode (e.g., element 24 in FIG. 1). As can be easily seen in FIG. 1 of the Application, each of the exemplary elements 21, 22 and 24 are arranged in directly stacked layers, i.e., there are no open spaces or voids arranged between these layers. This is consistent with the definition of "substrate" normally used in the relevant art.

The Examiner alleges that the recited: (1) "visual side substrate" is equivalent to *Masuda's* glass substrate 5a; (2) "transparent substrate" is equivalent to *Masuda's* light guide 3; and (3) "low refractive index transparent layer" is equivalent to *Masuda's* low refractive resin layer 10a. Applicants disagree.

Applicants respectfully submit that the Examiner's allegation that the separate light guide 3 and glass substrate 5a of *Masuda* somehow constitute a single "substrate" is both unreasonable and unsupported by *Masuda*. The Examiner has failed to explain why he thinks such separate pieces can form a single "substrate," or to cite a single example of a LCD arrangement that classifies discrete layers that are physically separated by an intervening gap as a single "substrate." In fact, Appellant respectfully submits that the only reasonable reading of *Masuda* is that only glass substrate 5a corresponds to the recited "visual-side substrate."

(E) The Examiner's Identification of A Single Element of Masuda As Both The Recited "Visual Side Substrate" and "Optical Path Control Layer" Is Unreasonable

Claims 1 and 20 recite "an optical path control layer" (e.g., element 11 in FIG. 1) "on an outer side" (claim 1) or "on an upper surface" (claim 20) "of the visual-side substrate" (e.g., a

combination of elements 21, 22 and 24). FIG. 1 of the Application shows an example of such an arrangement, where element 11 is a discrete “layer” arranged “on” the “visual-side substrate” (supported by intervening layers 12 and 13). This is consistent with the definition of “layer” normally used in the relevant art.

The Examiner alleges that the recited “optical path control layer” is equivalent to upper surface 3c of light guide 3.

However, Applicants respectfully submit that the Examiner’s allegation that upper surface 3c of *Masuda* corresponds to the “optical path control layer” and is somehow different from the light guide 3 itself, is both unreasonable and unsupported by *Masuda*. First, a “layer” and a “surface” are two quite different features, as a “layer” necessarily requires a thickness, while a “surface” does not. Further, even if the upper surface 3c could be considered a “layer,” it is not a discrete portion identifiably different from light guide 3 of *Masuda*. In fact, Appellants respectfully submit that the only reasonable interpretation of *Masuda* is that light guide 3 corresponds to the recited “optical path control layer,” and that (as discussed above) glass substrate 5a corresponds to the recited “visual side substrate.”

Thus, Applicants respectfully submit that independent claims 1 and 20 are patentable over the applied references. Further, Applicants respectfully submit that rejected dependent claims 2-19 are allowable at least by virtue of their dependency.

Responses to Examiner’s “Responses”

The Examiner has provided seven numbered “responses” to Applicant’s arguments on p. 19 -21 of the *Office Action*.

Regarding Examiner's response (1), Applicants have not presented this argument in the June 27, 2005 *Amendment*, although it is surely true that *Masuda* fails to teach or suggest the claimed angular range. As this failure of *Masuda* was the reason that the December 7, 2004 *Office Action* was issued (to utilize *Egawa* in the rejections therein) it seems to have already been conceded that Applicants' position (in previous *Office Actions*) regarding *Masuda* was correct. Thus, it is not understood why the Examiner continues to include these arguments in *Office Actions*.

Regarding Examiner's responses (2), (3) and (6), it is not believed that these arguments were presented in the June 27, 2005 *Amendment*, at least as paraphrased on page 19 by the Examiner.

Regarding Examiner's responses (4) and (5), the Examiner seems to be disagreeing with Applicants' position (see section D above) that the separate light guide 3 and glass substrate 5a of *Masuda* (which are specifically indicated to be separated by an air gap) cannot reasonably be read as providing a single "substrate." Specifically, the Examiner seems to argue that because the front light "is part of the reflective type liquid crystal display panel as it is delivered to the end user, it and glass substrate 5a can be considered a single substrate. Applicants respectfully disagree, and submit that such a proposition is not correct, as just because items are delivered together in a single package does not mean that they can reasonably be read as being a single "substrate" (e.g., a wheel on a car). Further, *Masuda* is specifically directed to providing a construction where the light guide 3 and glass substrate 5a are separated by an air gap.

Regarding Examiner's response (6), the Examiner seems to allege that, since light guide 3 is "dual purpose," it is equivalent to both the "optical path control layer" and "visual side substrate" recited in independent claim 1. Applicants respectfully disagree, and submit that a single light guide 3 cannot teach or suggest claim 1's: (1) "visual-side substrate; and (2) "optical path control layer" that is "on an outer side of said visual-side substrate." Specifically, the Examiner has not (and cannot) identify any "outer side" of the visual-side substrate," or any "layer" on that "outer side."

Regarding Examiner's response (7), the Examiner alleges that one of skill "would know from [*Egawa*] to use the angle range [in *Masuda*] and would not be confused by the differences in the front light designs" and that the teachings of *Egawa* are "robust with motivation" to "adjust the pattern of grooves" in *Masuda*. Applicants respectfully disagree, and submit that the Examiner has still not addressed Applicants' arguments.

Specifically, the underlying motivation of a *prima facie* obviousness rejection cannot be shown simply by arguing that one of skill "would not be confused," or that one reference is "robust" with motivation. Rather, it has long been held (as pointed out above), that the Examiner must "show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for a combination in the manner claimed." *In re Rouffet*, 47 USPQ2d 1453 (Fed.Cir. 1998). Here, the Examiner has not done so, as he has not provided a single reason or rationale that would have lead one of skill to modify *Masuda*'s specific configuration (at least as currently alleged).

Conclusion

In view of the foregoing, it is respectfully submitted that claims 1-44 are allowable.
Thus, it is respectfully submitted that the application now is in condition for allowance with all of the claims 1-44.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Please charge any fees which may be required to maintain the pendency of this application, except for the Issue Fee, to our Deposit Account No. 19-4880.

Respectfully submitted,



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Date: December 7, 2005